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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,412	06/21/2001	Jerome E. Lengyel	MS1-603US	8941

22801 7590 11/17/2004

LEE & HAYES PLLC
421 W RIVERSIDE AVENUE SUITE 500
SPOKANE, WA 99201

EXAMINER	
NGUYEN, KIMBINH T	

ART UNIT	PAPER NUMBER
2671	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/887,412	LENGYEL, JEROME E.	
	Examiner	Art Unit	
	Kimbinh T. Nguyen	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/22/04 has been entered.

2. Claims 1-30 are pending in the application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-6 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. "A Thin Shell Volume for Modeling Human Hair", IEEE, published May 2000, pages 104-111 in view of Brinsmead (5,764,233).

Claims 1 and 6, Kim et al. teaches generating a mesh grid (3D grid) of uncovered surfaces of the object (hair strands; page 105, lines 18-21 of the left column; figs. 1(c) and 2), the mesh grid including at least one grid element (a rectilinear 3D grid; fig. 1c, page 105); simulating hair by associating at least one seed each grid element (each cell of the grid is associated with a list of particles that reside inside it; fig. 1c,

page 105; each hair is associated with M particles that lies along its path; section 3, page 106); generating the hair in such a manner that at least one hair extends from each seed (volumetric textures extend a 3D volume of hair over the surface; see section 1, page 104), at least a portion of the hair extending beyond boundaries of the grid element (a thin shell volume is constructed on each surface. Inside the volume, hairs are associated with particles that move under constraints that model (boundaries of the grid element) the hair-hair interaction during combing; see page 105, the left column, lines 1-9; particles p are distributed among the cells (fig. 2) representing each strand passing through a cell; see section 2.1, page 105). Kim does not teach generating the hair in real-time; however, Brinsmead teaches method for simulating hair in real-time on a graphics (col. 2, lines 62-63; col. 4, line 47, lines 52-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of rendering hair in real-time taught by Brinsmead into the a thin shell volume for modeling human hair of Kim for generating the hair, because it would provide a technique for simulating hair in real-time, allow a user to create a desired hair style or fur pattern and allow the user to view complex simulations of hair in real-time on a graphics workstation (col. 2, lines 61-63).

Claim 2, Kim et al. teaches parameterizing a texture in each of the grids (in fig. 1(c), a TSV is parameterized by the three variables (s, t, u), see page 105, section 2.1).

Claim 3, Kim et al. teaches identifying interactive (hair-to-hair interaction, see abstract) control and/or viewing parameters associated with each grid element of the mesh grid parameters (s, t, u) corresponding to the parameter (i, j, k) of the grid index)

which determine which grid elements of the surface detail model are used to render surface detail in that grid element (each cell of the grid is associated with a list of particles that reside inside it, see page 105, section 2.1 and fig. 2).

Claim 4, Kim et al. discloses generating a shell texture model (TSV Model, fig. 3) for each grid of the mesh on the parameterization (s,t,u) of the grid elements (see page 105, section 2.1; section 2.2 page 106; figs. 2 and 3).

Claim 5, Kim et al. teaches generating a shell texture model (Thin Shell Volume (TSV) Model) for each element of a dynamically generated grid element representation of uncovered surfaces of an object (vertical motions of particles, see pages 107-108, section 3.4 Vertical Motion (u-direction; using the standard dynamics techniques for each strand's motion, see page 108, section 5. Animation).

Claim 23, Kim et al. teaches at least on seed (particles) contained within each mesh grid element of the mesh grid (each cell of the grid is associated with a list of particles that reside inside it; see page 105).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. "A Thin Shell Volume for Modeling Human Hair", (IEEE, published May 2000, pages 104-111) in view of Brinsmead (5,764,233) and further in view of Meyer et al. "Interactive Volumetric textures" (iMAGIS laboratorie GRAVIR/IMAG-INRIA, France, published 1998).

Claim 7, Kim et al. does not teach transparent texture; however, Meyer et al. teaches utilizing the volume texture to generate (encode) semi-transparent (or transparent) concentric shells of the volume texture (slices of the volume which is

concentrated in the neighborhood of the surface), which are layered over select areas of the object surface (are mapped onto underlaying surface or superimposing these transparent slices, see abstract and section 1.1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching as taught by Meyer for mapping transparent layers into the Kim's method to generate transparent concentric shells of the volume texture with an extrusion offset, because it would increase the visual complexity of scenes displayed in the scope of interactive rendering (see conclusion).

6. Claims 8-13, 15-20, 24-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. "A Thin Shell Volume for Modeling Human Hair", (IEEE, published May 2000, pages 104-111) in view of Brinsmead (5,764,233), and further in view of Rouet et al. (5,758,046).

Claim 8, the rationale provided in the rejection of claim 1 is incorporated herein. In addition, Kim teaches at least one hair extending from each seed so that a portion of the hair extends in a direction that has a perpendicular component to a plane formed by the mesh grid element (the s vector is orthogonal to both u (the u vector is aligned with the depth direction of the hair volume) and t (the t vector is aligned with the major direction of the hair flow); see section 2.1, page 105 and fig. 2, page 106). Kim does not teach a storage medium; however, Rouet et al. teaches a storage medium (storage 110, fig. 1) which executable instruction to implement a modeling agent (col. 2, lines 49-56) to develop a surface detail model (geometric model for the actual hair, col. 3, lines 1-12; fig. 3), and to render surface detail (rendering Details) over an object surface (col. 5,

lines 25-47); and Kim teach instruction to implement a modeling agent (computer generated "virtual humans" are widely used in many areas, as virtual agents (see section 1, page 104). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the computer readable medium taught by Rouet's teaching into modeling human hair of Kim's method for implementing a modeling agent by using iterative generating and rendering of hair in order to achieve realistic modeling of hair computationally practical manner, because it would achieve a high-degree of visual realism demands that the computer-generated image reflect lifelike digital representations of fine-grained objects (col. 1, lines 15-16). Further, **Claims 9 – 13 and 24**, Rouet et al. discloses a storage medium (see the rejection of claim 8 above), comprising claimed elements corresponding to claims 1, 2, 4, 5 and 23 as taught by Kim et al. (see the rejection of claims 1, 2, 4 and 5 above).

Claims 15-20 and 25 claim an apparatus comprising claimed elements corresponding to the rejection of claims 8-13; therefore, claims 15-20 are rejected under the same reasons set forth in claims 8-13.

Claim 26, the rationale provided in the rejection of claims 1 and 8 is incorporated herein. In addition, Kim teaches the vertical motions of particles are generated in a way that combed hair moves upward (outward); see section 4, page 107.

Claims 27 and 28, each surface detail element includes a hair (a thin bounding volume that encloses a given hair surface; see abstract, page 104).

Claims 29 and 30, the rationale provided in the rejection of claims 1 and 8 is incorporated herein.

7. Claims 14, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. "A Thin Shell Volume for Modeling Human Hair", (IEEE, published May 2000, pages 104-111) in view of Brinsmead et al. (5,764,233) and further in view of Rouet et al. (5,758,046) and Meyer et al. "Interactive Volumetric textures" (iMAGIS laboratorie GRAVIR/IMAG-INRIA, France, published 1998).

Claim 14, Kim does not teach a storage medium; however, Rouet et al. discloses a storage medium (see the rejection of claim 8 above); It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the storage medium taught by Route into modeling human hair of Kim's method, because it would achieve a high-degree of visual realism demands that the computer-generated image reflect lifelike digital representations of fine-grained objects (col. 1, lines 15-16). Rouet does not teach generate semi-transparent; however; Meyer et al. teaches utilizing the volume texture to generate (encode) semi-transparent (or transparent) concentric shells of the volume texture (slices of the volume which is concentrated in the neighborhood of the surface), which are layered over select areas of the object surface (are mapped onto underlaying surface or superimposing these transparent slices, see abstract and section 1.1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of interactive volumetric texture taught by Myers's method into the storage medium taught by Rouet's method to generate semi-transparent of the volume texture, because it would increase the visual complexity of scenes displayed in scope of interactive rendering (see section 7 conclusion). Further, **Claim 22**, Rouet et al. discloses a memory device (storage unit

110); a controller (CG 130, fig. 1) coupled to the memory device to implement the surface modeling agent (to perform the task of modeling, col. 2, lines 54-65; fig. 1).

Claim 21, the rationale provide in the rejection of claim 14 is incorporated herein.

Response to Arguments

8. Applicant's arguments filed 09/22/04 have been fully considered but they are not persuasive because Brinsmead teaches a method for simulating hair in real-time.

With respect to applicant's arguments, the rejection of claims 1, 8, 15 and 26 have been modified in accordance to the amendment (see the Office Action).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimbinh T. Nguyen whose telephone number is (703) 305-9683. The examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Friday from 7:00 AM to 3:30 PM.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 12, 2004

Kimbinh Nguyen

Patent Examiner AU 2671